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MAY

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Articles:

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Stability of various sodium hypochlorite solutions

Piskin B, Turkun M. Stability of various sodium hypochlorite solutions. J Endodon 1995; 21:253-5.

PURPOSE: To investigate the effects of storage temperature, concentration, and time on the chemical stability of three different brands of commercial household bleaching agents as a source of NaOCl, and to compare the stability of these brands.

M&M: Three brands of bleach (Hypo, Clorox, and Domex) were evaluated. The pH was measured at 0, 60, and 200 days for 5.0 and 0.5% solutions. To determine stability the percentage of available chlorine was measured at 0 to 15, then 22, 29, 36, 43, 60, 95, 131, 177, and 200 days. Different storage temperatures were also evaluated.

RESULTS: The solutions stored at 24°C showed a higher decomposition rate than ones stored at 4°C. The decomposition rate of 0.5% solutions was not significantly different among the different brands. A gradual loss of pH was noted over time.

C&C: If refrigerated NaOCl remains relatively stable for long periods of time. At higher storage temperatures (24°C) NaOCl may lose 31 to 34% of available chlorine over a 200 day period.

May 1995 **Martin Gambill**

Effect of a final alcohol rinse on sealer coverage of obturated root canals

Wilcox LR, Wiemann AH. Effect of a final alcohol rinse on sealer coverage of obturated root canals. J Endodon 1995;21:256-8.

PURPOSE: To determine if alcohol use permits better sealer coverage of root canal walls during obturation.

M&M: Forty single-rooted teeth with root canal curvature <30 degrees were prepared to an apical size #35. The teeth were randomly divided into 4 groups according to the method of sealer placement and final irrigant: lentulo spiral and NaOCl, file and NaOCl, lentulo spiral and alcohol, and file and alcohol. All teeth were obturated by lateral condensation and AH26 sealer. Teeth were decalcified and cleared. The amount of sealer in the coronal, middle, and apical thirds was evaluated.

RESULTS: All specimens showed sealer present in all areas examined. The alcohol irrigant groups tended to have better sealer coverage, but the differences were not statistically significant. The coronal third demonstrated the greatest sealer coverage. The middle and apical thirds showed variable sealer coverage.

C&C: The sealer was wiped off in the coronal third and the file or lentulo spiral is placed into the canal. Thus, less sealer is available to coat the middle and apical thirds. Careful drying with paper points may be more beneficial in sealer being able to coat the canal walls than what is used as a final irrigant.

May 1995 **Bruce Poulsen**

Physical dimensions, torsional performance, bending properties, and metallurgical characteristics of rotary endodontic instruments. VI. Canal master drills

Luebke NH, Brantley WA, Sabri ZI, Luebke FL, Lausten LL. Physical dimensions, torsional performance, bending properties, and metallurgical characteristics of rotary endodontic instruments. VI. Canal master drills. J Endodon 1995; 21:259-63.

PURPOSE: To report the physical dimensions, torsional performance, bending properties, and metallurgical characteristics for all sizes of Canal Master drills.

M&M: Canal Master stainless steel drills sizes #50, #60, #70, #80, #90, and #100 were evaluated using ANSI/ADA specifications for physical dimension, and torsional performance. Bending properties were measured with a Tinius Olsen stiffness tester, and bending fatigue was measured on a unique laboratory apparatus. Scanning electron microscope (SEM) examination of selected specimens was also performed.

RESULTS: In the torsional tests the instruments fractured near the bur head, and in the bending tests they fractured at the point of maximum bend. SEM evaluation exhibited ductile torsional fracture of the instruments. Results of the tests may help establish ANSI/ADA standards for rotational instruments.

C&C: Canal Master drills should not be allowed to bind in the canal or they are likely to separate near the bur head. If they are not allowed to bind they will probably separate further up the shaft at the point of maximum bending, which may allow easier removal.

May 1995 **Martin Gambill**

Comparison of three files to prepare curved root canals

Bou Dagher FE, Yared GM. Comparison of three files to prepare curved root canals. J Endodon 1995;21:264-5.

PURPOSE: To compare three different files in enlarging curved root canals and to determine if significant deviation from the original canal curvature occurs following their use in circumferential filing.

M&M: The mesiobuccal canals of ninety-six extracted maxillary molars were radiographed and the canal curvature was determined. The teeth were divided into three groups. One group was instrumented with Flex-R files, one with Ultra-Flex files (nickel-titanium), and one with K-type files. The files were used in an in-and-out linear movement in a circumferential motion. The canals were prepared to #35 at the apex. A final radiograph was taken with a #35 file to the apex to determine the postinstrumentation canal curvature. The angle of curvature difference was calculated.

RESULTS: The angle of curvature was better maintained with Flex-R and Ultra-Flex files than with K-files. There was no difference between Flex-R and Ultra-Flex files.

C&C: The Flex-R files were as efficient as the nickel-titanium files in maintaining the canal curvature. However, the Flex-R files may have provided better results if they had been used as designed for the balanced force technique instead of circumferential filing.

May 1995 **Bruce Poulsen**

Efficacy of XeCl 308-nm excimer laser in reducing dye penetration through coronal dentinal tubules

Stabholz A, Rotstein I, Neev J, Moshonov J, Stabholz A. Efficacy of XeCl 308-nm excimer laser in reducing dye penetration through coronal dentinal tubules. J Endodon 1995; 21:266-8.

PURPOSE: To evaluate the efficacy of XeCl 308-nm excimer laser irradiation in sealing the dentinal tubules of coronal dentin in extracted human teeth, using a dye penetration assay.

M&M: Twenty extracted maxillary and mandibular molars had their crowns sectioned and the occlusal surface ground until a flat dentin surface remained. Pulp tissue was removed and the teeth were soaked in 6% citric acid then all dentin surfaces were sealed with nail polish. A XeCl excimer laser generating UV rectangular 15-ns short pulses at a wavelength of 308 nm was used to irradiate the experimental specimens (through the nail polish) at a fluence of 0.7 J/cm2. Pulse repetition rate was 25 Hz, irradiation exposure time was 4 s, and the spot size was 0.08 cm2. Permeability of the dentinal tubules was determined by soaking the teeth in methylene blue dye for 48 h and grinding the specimens to determine the amount of penetration. The controls were teeth with a similar layer of dentin which was left exposed, but not irradiated.

RESULTS: Mean dye penetration through dentinal tubules was significantly less in the lased group than the non-lased controls. However the lasing process did not completely seal the tubules as some dye penetration was seen in this group also.

C&C: The effect of lasing the nail polish on the dentin surface was not discussed in this study, but this may have an effect upon the results, and makes the clinical applicability of this study questionable. The heat generation produced by this type of laser was also not addressed, but would be of concern when using this technique to seal tubules in teeth with vital pulps.

May 1995 **Martin Gambill**

A scanning electron microscopic study of external root resorption in replanted dog teeth

Günday M, Sazak H, Türkmen C. A scanning electron microscopic study of external root resorption in replanted dog teeth. J Endodon 1995;21:269-71.

PURPOSE: To observe the external root resorption in dog teeth that had been replanted with either the pulp intact after 5 minutes, or with the root canal filled after times in saline of 30 and 120 minutes.

M&M: Nine front teeth were extracted from two dogs. The teeth were divided into three groups: teeth kept in saline for 5 min and then replanted with the pulp intact, teeth kept in saline for 30 min and the canals filled with Calciobiotic Root Canal Sealer before replantation, and teeth kept in saline for 120 min and the canals filled with the aforementioned sealer before replantation. The teeth were splinted for one week and three months after replantation, the teeth were reextracted. The apical area of each root was examined under SEM.

RESULTS: In the teeth that were replanted with the pulp intact, extensive and severe surface resorption was observed in areas including the dentin. In the other two groups, surface resorption which included the dentin and tubules was observed. The resorption was more pronounced in the 120 min group than for the 30 min group.

C&C: Nothing new from what we have learned from Andreasen.

May 1995 **Bruce Poulsen**

Scanning electron microscopic evaluation of ultrasonic debridement comparing sodium hypochlorite and Bardac-22

Panighi MM, Jacquot B. Scanning electron microscopic evaluation of ultrasonic debridement comparing sodium hypochlorite and Bardac-22. J Endodon 1995; 21:272-6.

PURPOSE: To compare, in the apical third of the root canal, the debridement and the smear layer removal capabilities of a 3% solution of sodium hypochlorite with a 0.5% solution of Bardac-22, a new formula of quaternary ammonium derivative.

M&M: Twenty-three extracted maxillary incisors were divided into 3 groups. Group 1 was irrigated with saline, Group 2 with 3% NaOCl, and Group 3 with 0.5% Bardac-22 (quaternary ammonium derivative composed of didecyldimethyl ammonium chloride (50%), isopropanol (20%), and water (30%). Hand file and ultrasonic irrigation of the canals in the experimental groups was performed with a total of 3 min of ultrasonic irrigation and 96 ml of irrigant. The control group (saline) was not irrigated ultrasonically. Scanning electron microscope (SEM) examination of 4 sections from the apical 5 mm of each canal was compared for remaining debris.

RESULTS: The Bardac-22 appeared to be a better inorganic solvent than NaOCl since less smear layer was found with it, but it was a poorer organic solvent than NaOCl since it left more pulp tissue in the canal. A combination of the two solvents using ultrasonic activation was advocated by the authors to take advantage of the properties of both of the chemicals.

C&C: Bardac-22 may represent an alternative or adjunct to NaOCl as an irrigant, but this study did not address toxicity, antibacterial properties, and other important considerations for a new irrigant.

May 1995 **Martin Gambill**

An in vitro evaluation of irrigating characteristics of ultrasonic and subsonic handpieces and irrigating needles and probes

Kahn FH, Rosenberg PA, Gilksberg J. An in vitro evaluation of irrigating characteristics of ultrasonic and subsonic handpieces and irrigating needles and probes. J Endodon 1995;21:277-80.

PURPOSE: To evaluate the efficacy of a variety of endodontic irrigating devices.

M&M: Clear resin blocks with root canals with a curvature of ~30 degrees were used. A size #25 file was the largest instrument used to the apex (step-back to #35). In the Cavi-Endo system, size #35 files were used to complete instrumentation. Blocks were divided into 2 major groups: those irrigated with a syringe-delivered irrigant, those irrigated by the ultrasonic and subsonic handpieces. The first group was subdivided according to needle/probe size utilized: B-D 22-ga beveled needle, Monoject 23- and 27-ga needles, and Max-i-Probe 25-, 28, and 30-ga probes. The second group was subdivided into blocks irrigated by: Cavi-Endo, and Micromega 1500. Sixteen blocks were evaluated for each size of tested modality. After instrumentation, the canals were filled with dye (group 1). In the second group, the dye was placed prior to instrumentation. The efficacy of each irrigating device was judged by percentage of dye clearance.

RESULTS: The Max-i-Probe probes were the most effective instrument used to clear dye. The other syringe-delivered system were relatively ineffective. The ultrasonic and subsonic systems were highly effective up to size #30.

C&C: The effectiveness of the Max-i-Probe seemed to be related to its design. Fluid expression creates turbulence around and beyond the end of the probe. The standard beveled needles were ineffective because they could not be placed closer than 5 or 6 mm from the canal apex. With increased canal enlargement, the beveled needles may gotten closer to the apex and may have been more effective.

May 1995 **Bruce Poulsen**

Practical application of infection control in endodontics

Reams GJ, Baumgartner JC, Kulild JC. Practical application of infection control in endodontics. J Endodon 1995; 21:281-4.

PURPOSE: To offer a review and practical application of infection control methods in the practice of endodontics.

DISCUSSION: This article presents the "Universal Precautions" concept of infection control, and presents recommendations made by the ADA, and OSHA. Specific areas discussed in the article include the use of physical barriers, instrument processing for sterilization, chemical disinfectants, radiology, and other specific endodontic considerations.

C&C: A good review of concepts and procedures which are already in place in most, if not all Air Force dental clinics.

May 1995 **Martin Gambill**

Unusual fracture of a maxillary second premolar

Legan JJ, Brown CE, Andres CJ. Unusual fracture of a maxillary second premolar. J Endodon 1995;21:285-6.

PURPOSE: To report a case of horizontal root fracture in a maxillary premolar that may have an iatrogenic cause.

CASE REPORT: A 66-yr-old female was diagnosed with a horizontal root fracture during a routine radiographic examination. The patient was asymptomatic and was not aware of any trauma to the area. The tooth tested vital and had no restorations or caries. No abnormal periodontal pocketing was present. One possible explanation for this fracture was the placement of the overcontoured crown placed on #3. If excess force was used in placing the crown, then the root fractured may have occurred. Excess force should not be used in placement of cast restorations because of the force that may be placed on adjoining teeth.

May 1995 **Bruce Poulsen**

Removal of overextended gutta-percha root canal fillings in endodontic failure cases

Metzger Z, Ben-Amar A. Removal of overextended gutta-percha root canal fillings in endodontic failure cases. J Endodon 1995; 21:287-8.

PURPOSE: To present a procedure by which overextended root canal fillings may be predictably removed.

M&M: Eighteen cases of root canal failures with overextended gutta percha (GP) were treated with the following technique: Coronal GP was removed with 3 or 4 round burs to a depth of 2 to 3 mm. Xylene was placed into the coronal space and a #20 file was worked into the GP creating a channel to within 3 or 4 mm of the apex, but GP was not removed in this step. A radiograph was taken to confirm this length. Now the Xylene was removed and NaOCl was placed in the canal and coronal GP was removed with hedstrom files to within 3 to 4 mm of the apex. Another radiograph was taken to confirm this step. A new #30 or 35 hedstrom file was rotated 0.5 to 1.0 mm beyond the apex and slowly and firmly withdrawn to remove the remaining GP including the overextended segment.

RESULTS: Seventeen of the eighteen treated cases were successful in removing the overextended GP using this technique.

May 1995 **Martin Gambill**